DOCUMENT RESUME

ED 476 592 FL 027 684

AUTHOR	Mtenje, Al
TITLE	An Optimality Theoretic Account of Ciyao Verbal Reduplication.
PUB DATE	2002-00-00
NOTE	28p.; Paper presented at the Annual Conference on African Linguistics (33rd, Athens, OH, March 22-24, 2002).
PUB TYPE	Reports - Descriptive (141) -- Speeches/Meeting Papers (150)
EDRS PRICE	EDRS Price MF01/PC02 Plus Postage.
DESCRIPTORS	*Bantu Languages; *Linguistic Theory; Morphemes; Uncommonly Taught Languages ; *Verbs
IDENTIFIERS	*Optimality Theory; *Reduplication (Phonology)

ABSTRACT

The articulation in recent years of Optimality Theory (OT) has paved the way for a reanalysis of linguistic phenomena that were previously accounted for by derivational theories through various modes of rule interaction. The theory has been shown to offer insightful accounts of various processes involving segmental and prosodic structure and has provided revealing solutions to tone assignment problems in Bantu and other languages. The explanatory power of the OT model has been noted in accounts of reduplication facts in a number of languages. This paper discusses reduplication facts in Ciyao verbal constructions using the insights of OT. It shows that the lack of segmental identity between stems and reduplicants can easily be accounted for by subordinating faithfulness constraints to unvioble phonological constraints and also by aligning the left edge of the base with onsetful syllables in conformity with the Onset Principle. The paper shows that the requirement of surface base--reduplicant identity should, in some cases, be outranked by phonologically based constraints in order to account for instances of a surface mismatch between the base and the reduplicant. It offers details of Ciyao reduplication facts and discusses OT principles and their application to the reduplication cases. (Contains 55 references.) (SM)

Reproductions supplied by EDRS are the best that can be made
from the original document.

ED 476 592

AN OPTIMALITY THEORETIC ACCOUNT OF CIYAO VERBAL REDUPLICATION*

Al Mtenje
University of Malawi

PERMISSION TO REPRODUCE AND DISSEMINATE THIS MATERIAL HAS BEEN GRANTED BY

Al Mtenje

TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)

1

U.S. DEPARTMENT OF EDUCATION
Office of Educational Research and Improvement
EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)

☒ This document has been reproduced as received from the person or organization originating it.

☐ Minor changes have been made to improve reproduction quality.

• Points of view or opinions stated in this document do not necessarily represent official OERI position or policy.

BEST COPY AVAILABLE

FL027684

AN OPTIMALITY THEORETIC ACCOUNT OF CIYAO VERBAL REDUPLICATION*

Al Mtenje
University of Malawi

1.0 Introduction

The articulation in recent years of Optimality Theory (OT) has paved the way for a reanalysis of linguistic phenomena which were previously accounted for by derivational theories through various modes of rule interaction.

The theory has been shown, for instance, to offer insightful accounts of various processes involving segmental and prosodic structure (cf. Cole and Kisseberth 1994, Goedemans 1996, Downing 1999c, Ito and Mester 1999, McCarthy and Prince 1999, Myers 1997, Nagy and Reynolds 1997, Pulleyblank 1996, Ringen and Heinämäki 1999, Rosenthall 1994, Zoll 1996 among others). Likewise, OT has provided revealing solutions to tone assignment problems in Bantu and other languages (cf. for instance Odden 1998, Cassimjee and Kisseberth 1999, Carleton 1995, Hyman and Mtenje 1999, Bickmore 1997, Hubbard 1994 and related studies).

The explanatory power of the OT model has also been noted in accounts of reduplication facts in a number of languages, where it has provided insightful solutions to long standing descriptive and theoretical questions in numerous cases (see for example, Downing 1994, 1996, 1997, 1999a, b, 2000, 2001a, b, c, d, Inkelas and Zoll 1999, McCarthy and Prince 1995, Myers and Carleton 1996, Odden 1996 among others).

This paper discusses reduplication facts in Ciyao verbal constructions using the insights of Optimality Theory. It is shown that the lack of segmental identity between stems and reduplicants can be easily accounted for by subordinating faithfulness constraints to unviolable phonological constraints and also by aligning the left edge of the base with onsetful syllables in conformity with the Onset Principle (Ito, 1989). The paper also shows that the requirement of surface base – reduplicant identity should, in some cases, be outranked by phonologically based constraints in order to account for instances of a surface mismatch between the base and the reduplicant.

The paper is organized as follows:-

---

*I am grateful to David Odden and Laura Downing for the helpful comments I received on an earlier draft of this paper. I would also like to express my gratitude to Stella Kachiwanda and Frank Nantongwe both of whom are native speakers of Ciyao, for providing some of the data discussed in the paper and also for their judgements on data collected from other sources. Any errors of analysis or interpretation of the facts, however, remain my responsibility.

PL0276884

Section 2 presents details of Ciyao reduplication facts; Section 3 discusses OT principles and their application to the reduplication cases and Section 4 presents concluding remarks.

2.0 Reduplication in Ciyao

Ciyao, which has been classified by Guthrie (1967-1970) as being in zone P (P21), is a Bantu language spoken largely in Southern Malawi, northwestern Mozambique and Southern Tanzania. Although there are some minor phonological variations in the Ciyao dialects spoken in these countries, all of them maintain a high level of mutual intelligibility and most linguistic aspects are uniform across the dialects. The reduplication facts discussed in this paper therefore generally apply cross-dialectically in spite of their being based on Malawian dialects.

Tone plays a significant role in Ciyao, like in other Bantu languages. However, tone marking will be done only in crucial cases in this paper. The interested reader is referred to studies by Odden (1998), Mtenje and Odden (1990), Mtenje (1993), Carleton (1995) and others for more details and for various accounts of Ciyao tonal phenomena.

Reduplication in Ciyao verbal constructions, like in most other Bantu languages has been viewed as a prefixation rather than a suffixation process (cf. Odden 1996, Downing 1997, 1999a, 2000 and Cassimjee and Kisseberth 1998 for similar views on Kikerewe, IsiZulu, IsiXhosa and Kinande). Ngunga (1997) following Crystal (1997) for instance, argues that total reduplication in Ciyao is a case of prefixation where the verbal stem is repeated and prefixed to itself semantically indicating, in the majority of cases, that the action or event expressed by the stem is repeated or realized frequently at intervals.

In our discussion, we will assume the position taken by Ngunga (1997), Carleton (1995) and others that reduplication involves prefixation.

It is generally difficult in total reduplication to tell if the process involves prefixation or suffixation. For Ciyao there is some evidence to support the prefixation account. For instance, high tone assignment in polysyllabic infinitive verb stems as those in (5) shows that a maximum of two high tones are placed on the verb stem one on the first vowel which then doubles to the next vowel and the other on the final stem vowel. When the verb stem is reduplicated the final "a" of the first part of the verb does not have a high tone if the verb stem is long as in (5 iii). Instead, the third H tone appears on the final vowel of the second part of the verb. Since the normal pattern for H placement in the infinite is for the third H to be on the final vowel of the bare stem, we can conclude that the appearance of an H tone on the final -a- in (5 iii) shows that the vowel is the final vowel of the bare stem. This therefore indicates that the reduplicant appears in the prefix position.

Before discussing the details of Ciyao reduplication, we need to clarify some of the crucial terminology involving the verbal construction which will be adopted in this paper.

In Ciyao, like in other Bantu languages, verbs are morphologically complex and comprise prefixes (which may mark, among other things, the subject, object, tense/aspect and negation), a root and derivational and inflectional suffixes. Theoretically, any number of suffixes may follow the root although in practice, there are language-particular constraints on the ordering and number of permissible suffixes required to guarantee semantic acceptability. In Ciyao, like in many other Bantu languages, the verbal construction is ultimately terminated by a final tense-aspect affix which is usually the vowel /-a/, except in the subjunctive, perfective and past tenses where /-e/ occurs.

We will follow the analysis of the Bantu verb adopted in most studies (cf. for instance Myers 1998, Mutaka 1994, Mchombo 1999 etc.) whereby the root and any number of derivational extensions, excluding the final inflection, is referral to as a "derivational stem". The derivational stem plus inflectional suffixes including the final tense inflection vowel (the full stem) is called an "inflectional stem". Consider the example given in (1) below where a dash stands for a morpheme boundary.

(1)	tú – kú – kát – á	"we are cutting"
	tú – kú – kát – íl – a	"we are cutting for"
	tú – kú – kát – ísy – a	"we are causing to cut"
	tú – kú – kát – ísy – an – á	"we are causing each other to cut"
	tú – kú – kát – ísy – an – il – á	"we are causing to cut for each other"

In (1) the verb root /-kat/ is preceded by the first person (plural) subject prefix /tu/ and the tense prefix /ku/ and it is followed by the derivational suffixes /il/ (dative), /isy/ (causative) and /an/ (reciprocal) which are followed by the inflectional final vowel /a/. In the form /tu – ku – kat – isy – an – il – a/, the root /kat/ together with the derivational extensions /isy/, /il/ and /an/ form the derivational stem and this constituent becomes an inflectional stem when the final inflectional suffix /a/ is attached. As we will show below, productive reduplication in Ciyao copies the inflectional stem.

2.1 **Regular Reduplication**

2.1.1 **Monosyllabic Stems**

The reduplication of monosyllabic verb stems (formed through a

combination of a single consonant or a consonant followed by a glide) is shown in (2) (the reduplicated portion is underlined).

	Unreduplicated	Reduplicated	
(2)	ku – ly – á	ku – ly- á – ly – a – ly –a	"to eat"
	ku – gw – á	ku – gw – á – gw – a – gw -a	"to fall"
	ku – mw – á	ku – mw – á – mw – a –mw – a	"to drink"
	ku – w – á	ku – w – á –w – a – w –a	"to die"
	ku – p – á	ku – p – á – p – a- p – a	"to give"

In these constructions, which are from the most widely spoken Ciyao dialect, reduplication copies the root consonant(s) and the final inflectional vowel twice. As we will demonstrate later, this is in conformity with the general observation in Bantu languages (cf. Odden 1996, Mutaka & Hyman 1990, Downing 1997, 2000, 2001a) that reduplication copies a constituent which is minimally a foot.

There is a less widely spoken dialect which reduplicates monosyllabic verbs by copying the stem once only as shown in (3).

	Unreduplicated	Reduplicated	
(3)	ku – ly – á	ku – ly - á - l y – a	"to eat"
	ku – gw – á	ku – gw – á – gw – a	"to fall"
	ku - mw – á	ku – mw – á - mw – a	"to drink"
	ku – w – á	ku – w – á – w -a	"to die"
	ku – p – á	ku – p – á – p – a	"to give"

The implication of the differences in these two dialects for the reduplication process will be discussed later.

When monosyllabic verb stems appear in constructions with tense markers which are suffixed to the root and are more than one syllable long (such as the past tense suffix) the bisyllabicity condition on reduplication is satisfied and reduplication therefore copies the inflectional stem once only as shown in (4) below (/n/ = 1sg. Person subject prefix; /a/ = part of the tense marking; ile/ele[1] = past tense marker; /w/ = 3 sg. Person subject prefix).

	Unreduplicated	Reduplicated	
(4)	n – á – l – iíle	n – á – l – iilé – l – iile	"I ate"
	n – á-gw – iíle	n – á – gw – iilé – gw – iile	"I fell"
	n – á - mw – eéle	n – á – mw – eelé – mw – eele	"I drank"
	n – á – w – iíle	n – á - w – iilé – w – iile	"I died"
	n – á - p – eéle	n – á – p - eelé – p – eele	"I gave"
	w – á - l – iíle	w – á – l – iilé – l – iile	"he/she ate"

w – á – gw – iíle	w – á – gw – iilé – gw – iile	"he/she fell"
w – á – mw – eéle	w – á – mw – eelé – mw – eele	"s/he drank"
w – á - w – iíle	w – á – w – iilé – w – iile	"she/he died"

We now turn our attention to reduplicated constructions involving bisyllabic and longer verbs in the next section.

2.1.2 **Reduplication of Other Verbs**

The reduplication of verb stems which are more than one syllable long is shown in (5) below.

	Unreduplicated	Reduplicated	
(5) (i)	ku – sóv – á	ku – sóv – á - sov - á	"to be rare"
	ku – lááv – á	ku – lááv –á – laav – á	"to frequent something"
	ku – léémb – á	ku – léémb – a –leemb – á	"to write"
	ku – tíímb – á	ku – tíímb – a – tiimb – á	"to beat"
(ii)	tw – a – sóv – ilé	tw – a sóv –ilé – sóv – ilé	"We were rear"
	w – a – lááv – ilé	w – a –lááv-ilé- lááv – ilé	"he/she was frequent"
	w – a – léémb – ilé	w–a–léémb–ilé-léémb-ilé	"she/he wrote"
	n – a – tíímb – ilé	n–a–tíímb–ilé-tíímb-ilé	"I beat"

(iii)	ku – léémb-esy-an-a	ku-léémb-esy-an-a-leemb-esy-an- á "to cause each other to write"
	ku-tíímb-il-an-a	ku-tíímb-il-an-a-tiimb-il-an- á "to beat each other for"
	ku-púút-an-isy-a	ku-púút-an-isy-a-puut-an-isy- á "to cause to fight each other"
	ku-túúnd-il-an-a	ku-túúnd-il-an-a-tuund-il-an- á "to urinate on each other"

(-esy/isy-, -il- and –an- are causative, dative and reciprocal suffixes respectively).

The forms in (5i) show that only the inflectional stem is totally copied. In (5ii) where the tense marker /-ile/ occurs as an inflectional suffix, the inflectional stem is also copied in full but all prefixes, including the subject markers /-n/ and /-w/ are not copied. This shows that just like in (2), (3) and (4) above where monosyllabic verbs were reduplicated, regular verbal reduplication copies only the inflectional stem to the exclusion of prefixes[2].

The same facts hold when the verb stem contains a number of derivational suffixes as shown in (5iii) where the entire stem is copied.

It should be pointed out here that while some Bantu languages permit partial reduplication of a stem which contains two or more derivational suffixes by copying a contiguous sequence of such suffixes which follow the root, Ciyao does not. Odden (1996) for example shows that constructions such as those given in (6) below involving the reciprocal suffix /-an/, the dative suffix /-il/el/ and the causative suffix /-isy/ are acceptable in KiKerewe[3].

(6)	ku–bon–an–a	ku–bon-an-a-bon-an-a	ku-bon-a-bon-an-a "to see each other"
	ku-kam-isy-a	ku-kam-isy-a-kam-isy-a	ku-kam-a-kam-isy-a "to cause to milk"
	ku-lim-il-an-a	ku-lim-il-an-a-lim-il-ana	ku-lim-a-lim-il-an-a "to cultivate for each other"

In Ciyao, partial stem reduplication of the type in (6) is not allowed as demonstrated in (7).

(7)	ku – tíímb – an – á	*ku-tiimb-a-tiimb-an-a	"to beat each other"
	ku – táám – il – á	*ku-taam-a-taam-il-a	"to stay for"
	ku-léémb-esy- á	*ku-leemb-a-leemb-esy-a	"to cause to write"
	ku – wáláá ng-an- á	*ku-walaang-a-walaang-an-a	"to count each other"

As noted here, reduplication cannot involve part of the stem. Instead, the entire verb stem must be copied as shown in (5) above.

The only case where material attached to the stem may not be copied is when it appears as a clitic as noted below in subjunctive forms involving /-je/ (tu=we; a = you (prural)). The clitic adds emphatic meaning in these forms.

(8) a)	tu-leemb-é	tu-leemb-e-leemb-é	*tu-leemb-a-leembe "we should write"
b)	tu-leemb-e-jé	tu-leemb-e-je-leemb-e-jé	tu-leemb-e-leemb-e-jé "we should write"
c)	a-viin-é	a-viin-e-viin-é	*a-viin-a-viin-e "you should dance"
d)	a-viin-e-jé	a-viin-e-je-viin-e-jé	a-viin-e-viin-e-jé "you should dance"
e)	tu-taam-é	tu-taam-e-taam-é	*tu-taam-a-taam-e "we should stay"
f)	tu-taam-e-jé	tu-taam-e-je-taam-e-jé	tu-taam-e-taam-e-jé "we should stay"

As noted above, the forms in the third column in (8a, c and e) are unacceptable when the subjunctive vowel /-e/ is replaced by the regular verb – final vowel /-a/ when the stem is copied. The correct forms are those in the middle column where, as expected, the subjunctive stem is copied in its entirety.

What is particularly interesting is that when the clitic /-je/ (which shows emphasis) is added to the subjunctive stems as in (8b, d and f), this clitic may be optionally left out of the stem when copying occurs during reduplication as noted in the final columns of these forms. The fact that the clitic, but not the tense and derivational suffixes, may be left out of the stem by reduplication points to the fact that it is not part of the inflectional stem and this has interesting consequences for the analysis to be developed and proposed later in this paper. This also confirms the claim made earlier that the Reduplicant is prefixed since we would expect the stem and not the RED to obligatorily retain the clitic since these are ordinarily added to stems. The fact that the clitic /-je/ has to appear together with the second portion of the verb therefore shows that part to be a stem.

The limitation of copying to elements of the inflectional stem only in verbal reduplication as shown in (5) is also evident in constructions with object prefixes which usually occur immediately before the verb root as seen in (9) below (/si/, /ci/, /wu/ and /tu/ are object markers).

	Unreduplicated	Reduplicated	
(9)	ku-ci-léémb- á	ku-ci-léémb-a-leemb- á	"to write it"
	ku-wu-télék-a	ku-wu-téléka-telek- á	"to cook it"
	ku-tu-tíímb- á	ku-tu-tíímb-a-tiimb- á	"to beat us"
	n-a-cí-leemb-ilé	n-a-cí-leemb-ile-leemb-ilé	"I wrote it"
	w-a-sí-pat-ilé	w-a-sí-pat-ile-pat-ilé	"she/he got them"

As it can be noted above, all object prefixes are not copied when the verbs are reduplicated. The verb constructions here differ slightly from nouns, in that these allow for the reduplication of prefixes in cases where the bisylabicity condition is not satisfied due to the shortness of the roots. Consider the forms in (10) below.

10) (i) Nouns

Unreduplicated		Reduplicated	
m – twé	"ahead"	m-twé-m-twé	*m-twe-twe-twe "a real head"
mi-twé	"heads"	mi-twé-mí-twé	*mi-twe-twe-twe
m-bwá	"a dog"	m-bwá -m-bwá	*m-bwa-bwa-bwa "a real dog"

(ii) Adjectives

Unreduplicated		Reduplicated	
yeé-tu	"ours"	yetú-yetu	"really ours"
lyaá-wo	"yours/his/theirs"	lyaa-wó–lyaa-wo	"really yours/his/theirs only"
caá-wo	"theirs"	caa-wó-caa-wo	"really theirs"
ceé-nu	"yours"	cee-nú-cee-nu	"really yours"

(iii) Numbers

Unreduplicated		Reduplicated	
ju-mó	"one"	ju-mo-jú-mo	"one by one"
cl1-one		*ju-mo-mo-mo	
ci-mó	"one"	ci-mo-cí-mo	"one by one"
cl7 – one		*ci-mo-mo-mo	
li-mó	"one"	li-mo-lí-mo	"one by one"
cl5 – one		*li-mo-mo-mo	

In the word /m-twe/ in (10i), both the prefix /-m/ and the root /-twe/ are copied when the noun is reduplicated to satisfy the bisyllabicity condition. The same is true of the adjectival and number forms. Odden (1996) and Mutaka and Hyman (1990) noted similar facts in KiKerewe and Kinande respectively. Note that unlike in the monosyllabic verb roots in (2) where the stem was copied twice to meet the foot required, the nominal forms here do not do that. Instead they opt for the copying of prefixal material. This is in direct contrast to verbs where such an option is not available. Thus, no monosyllabic verb stems in Ciyao copy prefixes when they are reduplicated. Forms like *ku-ly-a – ku - ly- a or * ku – ku-ly-a -ly-a are therefore not attested.

The preceding discussion has shown the following characteristics about regular verbal reduplication in Ciyao:

11) a. The copied constituent (hereafter the Reduplicant, (RED) contains only the material found in the inflectional stem. Prefixes, including object markers are not copied. RED is attached as a prefix to the stem (the BASE).

b. Partial reduplication, where a contiguous sequence of derivational suffixes in the inflectional stem is copied, is not permitted

c. The final inflectional morpheme of subjunctive constructions /-e/ is obligatorily copied as part of RED and the usual verb – final inflection vowel /-a/ is not allowed as a possible final vowel of RED.

d. Monosyllabic verb stems regularly copy the stem twice to fulfill the bisyllabicity condition required for well formed Bantu words.

Having presented the basic issues of verbal reduplication in Ciyao, we now proceed to examine how these and related facts can be accounted for within Optimality Theory.

3.0 Optimality Theory – General Principles

In order for us to fully appreciate how OT can account for the reduplication facts presented above, an outline of the crucial OT principles and constraints to be used in this paper ought to be given.

The main proposal of OT is that, unlike in derivational theories of the type assumed and argued for in Generative Phonology, phonological outputs are not derived from underlying representations through the interaction of ordered rules. Instead, outputs are freely generated and the actual output for any input within a particular language is the one which is the most optimal given the ranking of relevant constraints in that language.

Constraints are largely regarded as universal, but their rankings are language-specific. The variation across and within languages has therefore been attributed to differences in the rankings of the same constraints.

The crucial principles of OT as outlined by McCarthy and Prince (1993a, b; 1994) Prince and Smolensky (1993) and others which will be assumed in this paper are presented in (12) below.

(12) **Principles of Optimality Theory**

(a) **Universality**: Universal Grammar (UG) provides a set CON of constraints which are universal and are universally present in all grammars

(b) **Violability**: Constraints are violable, but violation is minimal.

(c) **Ranking:** The constraints of CON are ranked on a language-specific basis; the notion of minimal violation is defined in terms of this ranking. Outputs which violate the least ranked constraints are relatively more optimal than those violating highly ranked constraints. A grammar is a ranking of the constraint set.

(d) **Parallelism:** The best satisfaction of the constraint hierarchy is computed over the whole hierarchy and the whole candidate set. There is no serial derivation.

Since OT allows for a free generation of outputs, it is in principle, possible for them to vary infinitely from the inputs they are based on. In order to constrain the

degree of abstractness or faithfulness between inputs and their outputs, correspondence theory imposes a set of constraints which make it optimal for inputs and outputs to be as similar as possible. In order to achieve this, the following set of correspondence constraints have been proposed:

(13) (a) MAX-Family of Correspondence Constraints
These delimit the level of abstractness between inputs and outputs by requiring that every segment of the input also appears in the output. The effect of these constraints is to prohibit segment deletion.

(b) DEP-Family of Correspondence Constraints

These constrain abstractness by requiring every segment of the output to also occur in the input. These constraints disallow insertion.

(c) IDENT-Family of Correspondence Constraints
This set of constraints requires every segment of the output to be featurally identical to the corresponding segment of the input.

The relevant correspondence constraints referred to above are given below.

Correspondence Theory (McCarthy and Prince 1995)

(14) (a) MAX Constraint Family
MAX – BR
Every segment of the base has a correspondent in the reduplicant.
MAX – IO
Every segment of the input has a correspondent in the output. (No deletion).

(b) DEP - BR
Every segment of the reduplicant has a correspondent in the base.
DEP – IO
Every segment of the output has a correspondent in the input. (No epenthesis)

(c) IDENT - BR
Reduplicant correspondents of a base segment are featurally identical to that segment.
IDENT – IO
Output correspondents of an input segment are featurally identical to that segment.

We now turn to a discussion of how the Ciyao reduplication facts summarized in (11) above can be accounted for in the context of the OT principles. To start with, the fact that RED is a prefix can be accounted for by alignment constraints. As stated in McCarthy and Prince (1993a, 1994), these constraints require constituents to share edges. Typically alignment constraints have the form shown in (15).

(15) **Generalized Alignment** (McCarthy and Prince 1993a, 1994).
Align (Cat 1, Edge 1, Cat 2, Edge 2); where cat 1 cat 2 are grammatical or prosodic categories and Edge 1, Edge 2 are either the left or right edge.

Since RED is attached to the stem as a prefix in Ciyao, we must show that it subcategorizes for a verb stem (VS) which therefore occurs to its right. In terms of alignment, its' right edge is aligned with the left edge of the VS. This is illustrated in the alignment constraint given in (16) below.

(16) **Align RED** (Align; adapted from McCarthy and Prince 1993a, b).
Align (RED, R; VS, L) i.e the reduplicant subcategorizes for a following verb stem.

As illustrated in (11), the data considered so far shows that in regular reduplication the entire inflectional verb stem is copied and prefixed to itself. The size of RED must therefore be defined as being maximally equivalent to an inflectional stem (IS). This is accounted for by a combination of the correspondence constraints given in (14) above and the Morpheme Integrity Constraint (MI) given in (17) below (cf. Mutaka and Hyman 1990).

(17) **MORPHEME INTEGRITY:** The segment at the edge of the derivational stem in the Reduplicant must have a correspondent at the edge of the morpheme in the base.

The effect of (17) is to punish any form of morpheme mismatch between RED and the stem arising from either overcopying or undercopying of the stem. A doubly copied verb stem yields a mismatch involving the segment at the end of RED and its correspondent at the edge of the BASE thus yielding a violation of MI. Since reduplication must faithfully copy the stem (thus maintaining its integrity), MI must be highly ranked and its violation, like that of Alignment, is likely to result in fatality.

We will also assume in our discussion the constraints of Contiguity and Anchoring (McCarthy and Prince 1993b) as shown in (18)

(18) Contiguity: RED corresponds to a contiguous (sub) string of Base
Anchoring: In RED + BASE, the initial element in RED is identical to the initial element in the Base.

Since RED always faithfully copies all the segments of IS as in the examples in (5i-iii) repeated below as (19), it must be the case that Max-BR (14a) is not violated hence the optimality of these forms.

(19) ku-sóvá-sová "to be usually rare"
ku-lááva-laavá "to frequent something'
ku-si-pátá-patá "to get them many times"
ku-wu-téléka-telecká "to cook it repeatedly'
tu-sovílé-sovile "we were usually rare"
wa-láávilé-láávilé "s/he frequented"
tu-ci-léémbile-leembile "we wrote it several times"
tu-si-pátíle-patile "we got them several times"
ku-púút-an-isy-a-put-an-isy-a "to cause fight each other

The tableau in (20) shows how the constraints given so far make the copying of the IS and the prefixation of RED optimal in Ciyao.

(20) Evaluation of reduplication candidates; ('[shows inflectional stem boundary and RED is underlined)

	/ku-RED-sova/	Integrity	MAX – BR	DEP – BR
✔	a) ku-sova-[sova			
	b) ku-sosova-[sova	*!	*	*
	c) ku-sovasova-[sova	*!	*	*
	d) ku-so-[sova	*!	*	*

The form in (20b) is not optimal because it violates the highly ranked MI, a constraint which stipulates that RED must be identical to the stem. In this case, sosova is not identical to the stem sova. It also violates DEP-BR since it has an overcopy of so. The candidate in (20c) also violates Morpheme Integrity because it contains a doubly reduplicated stem and is thus maximally not identical to IS. Candidate (20d) undercopies the stem and therefore leaves out (deletes) some segments of the IS thus violating MAX – BR and MI hence it is not optimal. The candidate which does not incur any violation of the constraints there is (20a) which is a total copy of the IS, hence it is the most optimal.

It may also be pointed out that the same constraints given in (20) above also account for the exclusion of object prefixes in Ciyao reduplication forms like those given below.

(21) tu-ci-léémb-ile-leemb-ile "we wrote it"
tu-si-pát-íle-pat-ile "we got them"
ku-tu-tíímb-a-tiimb-a "to beat us"

According to Align (16) which characterizes RED as an inflectional verb stem (defined in (1) above as comprising the derivational stem and inflectional suffixes up to the final vowel), the inclusion of the object prefixes in RED would violate the alignment constraint. Given that (16) is highly ranked, that violation would be fatal. Alignment therefore accounts for the optimality of the reduplicants in (21).

Let us now examine cases where partial stem reduplication is not permitted as exemplified in (7) above and repeated below in (22)

(22)	ku–tíímb-an-á	*ku–tiimb-a–tiimb-an-a
	ku–táám-il-á	*ku–taam-a-taam-il-a
	ku-léémb-esy-a	*ku-leemb-a-leemb-esy-a
	ku-wálááng-an-á	*ku-walaang-a-walaang-an-a

In languages where partial reduplication of the type shown above is operative, two related constraints have been called upon to account for such cases, namely Morpheme Integrity (17) and contiguity (18).

Morpheme Integrity has been invoked to ensure that there is a proper match between the edges of the BASE and that of RED. Contiguity guarantees that only contiguous segments of a portion of the Base are reduplicated. Thus in such languages, the omission of suffixes must ensure that it does not yield a non-contiguous set of segments in the Base.

In the case of the Ciyao forms in (22) where no truncation of the base is permitted, we ought to conclude that the identity requirement between the Base and the reduplicant overrides the option of deletion. In essence then, these constructions must obey total identity between the BASE and RED as stipulated by MI and MAX-BR.

Let us now consider the reduplication of monsyllabic verb stems as given in (2) and (3) where in one dialect (dialect A) the verb stem is copied twice (an overcopy and hence a violation of Morpheme Integrity) to fulfill the bisyllabicity condition on reduplicants and in another (dialect B), the stem is copied once only.

We would like to argue that these cases present an interesting example of how both morphology and phonology play a role in determining the shape of RED and also how different constraint rankings give different results in different dialects (and indeed different languages).

The predominant reduplication pattern which is characteristic of dialect A in which RED must be a foot shows that phonology "wins" over morphology in the sense that the prosodic condition for RED to be minimally a foot ranks more highly than the morphological requirement that it must be a verb stem. In this case then, RED "wants" to be a phonological word and since monosyllabic words in Ciyao (and of

course in Bantu generally) are not allowed, RED must be made up of a double copy of the verb stem and violate Morpheme Integrity.

In dialect B where the verb stem is copied only once, morphology ranks higher than phonology since RED simply ensures that it must be identical to the verb stem regardless of whether it will be a well formed phonological word or not. In other words, RED may or may not be a phonological word and in cases of monosyllabic verb stems, RED will violate the word-minimality constraint to ensure that it respects Morpheme Integrity. The evaluation of the candidates in the two dialects is given in the tableau below.

Dialect A

(23)

/ku-RED-ʃlya/	Word-Min	MI	MAX-BR	DEP-BR
a) ku-lya-ʃlya	*!			
✔ b) ku-lya-lya-ʃlya		*	*	*

Dialect B

/ku-RED-ʃlya/	MI	Word-Min	MAX-BR	DEP-BR
✔ a) ku-lya-ʃlya		*		
b) ku-lya-lya-ʃlya	*!		*	*

In dialect A in (23) the candidate in (a) violates the highly ranked constraint of word-minimality and is thus not optimal. Candidate (b) although violating Morpheme Integrity respects the highly ranked constraint Word-Minimality and is thus optimal.

In dialect B, where the ranking of the constraints is reversed, candidate (a) is more optimal than (b) because it does not violate the highly ranked constraint, MI while candidate (b) does and is thus not optimal.

We now turn our attention to cases of verb reduplication involving vowel-initial stems and those where regular Ciyao phonological rules create a mismatch between the features of the segments of RED and those of the Base. We start with vowel - initial verb stems.

3.1 Vowel – Initial Verbs

In Ciyao, there are several cases of verbs which show an alternation between a voiced alveo-palatal affricate /j/ and a vowel. Consider the forms in (24) below which are prefixed by the infinitive marker /ku/.

(24) ku-aang-a > kwaáángá "to answer"
ku-eelusy-a > kweelúsya "to advise"
ku-eendesy-a > kweendésya "to drive"

ku-iiv-a > kwíívá	"to steal"
ku-iigany-a> kwiigánya	"to teach"
ku-eend-a > kwééndá	"to walk"

The infinitive marker in these constructions triggers glide formation which is a widely attested rule in Bantu languages which changes a high vowel into a corresponding glide when it is followed by another vowel. On the surface, these verb stems appear to begin with vowels. However, when they are reduplicated the consonant /j/ appears in the initial positions as shown in (25)[4].

(25)

ku-aang-a>	kwáángá	kwaangá-jaangá	"to answer"
ku-eelusy-a>	kweelúsya	kweelúsya-jeelusya	"to advise"
ku-eendesy-a>	kweendésya	kweendésya-jeendesya	"to drive"
ku-iiva>	kwíívá	kwiivá-jivá	"to steal"
ku-iigany-a>	kwiigánya	kwiigánya-jiganya	"to teach"
ku-eend-a>	kwééndá	kweendá-jendá	"to walk"

In the forms above, the initial syllable of the Base begins with the consonant /j/ while RED is vowel - initial.

The question which immediately arises is whether the verb roots in (24) had an underlying /j/ which got deleted after the infinitive marker /ku-/ or whether they are underlyingly vowel initial and /j/ gets inserted when RED is prefixed as in (25).

It is not clear on the basis of these data alone which of the two possible analyses is more plausible since the occurrence of /j/ in the initial position of the BASE can be as a result of epenthesis which inserts the /j/ between the RED and the BASE to ensure that the BASE begins with an Onset as has been argued by Downing (1996, 1997) for Xhosa.

The most convincing evidence for the underlying presence of the consonant in the initial position of the stems comes from subjunctive and other tensed constructions which begin with a prefix other than the infinitive. Consider the examples in (26)

(26) i. Subjunctives

a-jaanj-é< /-aang-a/	"you should answer"
a-jeelusy-é< /-eelusy-a/	"you should advise"
tu-jeendesy-é< /-eendsy-a/	"we should drive"
tu-jeend-é< /-eend-a/	"we should walk"
a-jiigany-é< /-iigany-a/	"you should teach"

ii. Perfective tense

a-jaanj-íle< /-aang-a/	"he has answered'
a-jeendésy-e< /-eendesy-a/	"he has driven"
tu-jiiv-íle< /-iiv-a/	"we have stolen"
tu-jees-íle< /eend-a/	"we have walked"
a-jiigány-isye< /-jiigany-a/	"he has taught"

In the forms above, a /j/ appears in the initial position of the verb stem following the prefix vowels signaling its presence underlyingly. The same facts also obtain when the verbs appear in citation form (for instance when issuing commands) as shown in (27) below.

(27) (i)

jeelusya-ní (-eelusy-a)	"advise"
jeendesya-ní (-eendesy-a)	"drive"
jaanga-ní (-aang-a)	"answer"
jiiva-ní (-iiv-a)	"steal"
jiiganya-ní (-iigany-a)	"teach"

As it can be noted here, the verb stems are all consonant initial. Admittedly, it is possible for one to argue that in (27) above the initial /j/ is inserted in order to make the imperative verbs begin with an Onset as is indeed the case in some Bantu languages where such insertions are done in specific morphological environments. However, what appears to tip the scales in favour of a deletion rather than an insertion analysis is the fact that the /j/ would have to be inserted in an array of environments in the data in (24) to (27) while with deletion, the /j/ would be deleted only after the infinitive marker /-ku/ as in (24). Further evidence showing that the /j/ occurs after every other prefix except /-ku/ comes from object markers which are placed between the infinitive and the verb root as in (27 ii) below.

(27) (ii)

ku-tu-jélusya (ku-tu-jelusya-jelusya) -	"to advise us"
ku-ji-jéndesya)ku-ji-jendesya-jendesya) -	"to drive it"
kw-a-jáángá (kw-a-janga-janga) -	"to answer him/her"

As it can be seen here, /j/ occurs in the initial positions of both RED and the stem. It seems easier therefore to account for the facts under deletion rather than insertion.

The case of /j/ deletion in initial positions of infinitive stems creates instances of segmental mismatch between RED and the stem (Base). Consider the reduplicated forms involving vowel initial reduplicants and the Base presented above and repeated in (28) below.

(28)

kw-iigány-a	kw-iigány-a-jiigany-a	"to teach"
kw-íív-á	kw-iivá-jiivá	"to steal"
kw-eendésy-a	kw-eendésy-a-jeendesy-a	"to drive"
kw-ááng-á	kw-aang-á-jaang-á	"to answer"
kw-eelúsy-a	kw-eelúsy-a-jeelusy-a	"to advise"

In these forms, RED fails to match the segment at the left edge of the Base since the latter has /j/ as the onset whereas the former begins with a vowel. In fact, RED violates the Onset Principle (Ito 1989) given in (29) in that its left edge is not aligned properly with an onsetful syllable since it begins with a vowel. In essence, RED splits the syllable since morphologically, it is separated from the syllable (cf Downing 2000 for an interesting discussion on why RED should morphologically not be aligned with the initial syllable).

(29) **Onset Principle** (Ito 1989):

Avoid σ [$^{\mu}$s
(σ = syllable).

In order to correct this violation, RED however, prosodically gets syllabified with the preceding consonant /kw/ and actually forms the initial syllable of the word with a full onset.

The lack of proper prosodic correspondence between RED and the Base created by /j/ deletion whereby some elements of the Base lack correspondents in RED shows a number of important facts about the ranking of the constraints proposed so far.

Firstly, the lack of segment correspondence on the edges of RED and the Base represents a violation of Anchoring (18) which requires that the initial element in RED be identical to the initial element in the Base. Secondly, the mismatch between RED and the stem also shows a violation of Morpheme Integrity which demands that the two be identical. Thirdly, the fact that RED can begin with an onsetless syllable while the Base has an onsetful syllable in its initial position shows that the requirement for an onsetful syllable is respected by the Base but not RED.

In order to account for the violation of the Onset Principle, Morpheme Integrity and Anchoring one may propose a constraint which prohibits /j/ in the initial syllable of RED which must be ranked higher than Onset, Anchoring and MI. We give the /j/ constraint below.

(30) *ku-[j RED

An evaluation of the relevant candidates involving these constraints is given below.

(31)

/ku-RED-jeenda/	*ku-j	MI	Onset	MAX-BR	DEP-BR
a) kw-eenda-[jeenda ✔		*	*	*	*
b) ku-jeenda-[jeenda	*!				
c) kw-ee-[jeenda		*!	*	****!	*
d) kw-eenda-jeenda-[jeenda		*!!	*	*	*

In the tableau above, the most optimal form is (31a) because it respects the highest ranked constraint *ku-j since RED does not contain a /j/ as its onset. Candidate (31b) violates the most highly ranked constraint and is therefore not optimal. Candidate (31c) has multiple MAX-BR violations and also fails to respect MI hence it is not optimal. Candidate (31d) violates the next most highly ranked constraint, MI since there is an overcopy of the stem.

The candidate set above shows that by defining Onset as holding for the Base (by requiring that it should have a full onset) we explain why the optimal candidate [kweendajenda] is not fatal despite having RED with no full onset. Its acceptability is licenced by the most highly ranked constraint *ku-j which ensures that RED does not have an edge which begins with the consonant /j/ when it is preceded by an infinitive prefix. Downing (1997, 2000) has discussed comparable cases involving Base – stem misalignment in verbs with initial vowels in some Bantu languages.

The crucial constraint rankings for the above candidates is given below;

(32) **Crucial constraint Ranking:** j-deletion »MI » Onset » MAX-BR » DEP-BR

It should be pointed out here that although the analysis proposed above accounts for the facts, its biggest problem lies in the fact that the constraint proposed in (30) is more of a language-specific constraint than a universal one. Given the basic principle of OT that Universal Grammar provides a set of universal constraints from which specific languages make a selection, the postulation of a language-specific constraint like (30) appears to be a departure from this program. The basic problem with the /j/ alternation facts discussed here appears to be their idiosyncratic morphological

nature which limits the alternation to the infinitive prefix environment only. The question of whether idiosyncratic facts like these indicate the need for some tolerance for language-specific constraints like the one motivated here therefore requires further investigation.

3.2 **Reduplication of Nasal Prefixes.**

The phonology of Ciyao shows interesting sound alternations which are triggered by non-syllabic (moraic) nasals some of which have important consequences for constraints and their rankings in verbal reduplication. Ngunga (1997) for instance presents evidence to show that both moraic and syllabic nasals trigger the lengthening of vowels which precede them but only moraic nasals induce consonant voicing and deletion of surrounding segments. It is the case of voicing which will be of relevance to this paper since it yields further instances of lack of identity or correspondence between RED and its Base.

We begin with an illustration of cases of consonant voicing triggered by moraic nasals below.

(33)

ku-pél-á	"to be tired"
ku-télék-a	"to cook"
ku-pííkan-á	"to listen"
ku-kát-á	"to cut"

When the first person (singular) subject prefix is attached in tensed constructions like those in (34), the initial stem consonants are voiced as shown below.

Perfective tense

(34)

n-pel-ile » m-bes-íle	"I am tired"
n-telek-e » n-deléék-e	"I have cooked"
n-piikan-e » m-biikéen-e	"I have listened"
n-kat-ile » n-gat-íle	"I have cut"[5]

Likewise, when an object prefix containing a moraic nasal precedes the stem consonants, voicing of the consonants takes place as shown in (35) (where /n/ is the 1st person (singular) object prefix).

(35)

a-n-telec-ele » a-n-déléc-ele	"cook for me"
a-n-piikan-e » a-m-bííkan-e	"listen to me"
a-n-kat-ile » a-n-gát-íle	" cut for me"

When the forms with voiced consonants are reduplicated, there is a mismatch between the initial consonant of RED which appears

voiced and the initial consonant of the Base which remains voiceless. This is shown in (36) below.

(36)

n-pel-ile	m-bes-ílé-pes-ile	"I am tired"
n-telek-e	n-deléc-é-telec-e	"I have cooked"
n-piikan-e	m-biikéén-e-piikeen-e	"I have listened"
n-kat-ile	n-gat-ílé-kat-ile	"I have cut"

The same situation obtains with regard to the forms in (35) with object markers as shown in (37).

(37)

a-n-telec-ele	a-n-déléc-ele-telec-ele	"cook for me"
a-n-piikan-e	a-m-bííkan-e-piikan-e	"listen to me"
a-n-kat-ile	a-n-gát-íle-kat-ile	"cut for me"

In both (36) and (37) the moraic nasals, which are homorganic with the following consonants due to place assimilation, are not copied during reduplication. Furthermore, the initial consonants of the Base are not voiced. This therefore creates a case of lack of correspondence between the Base and RED. Odden (1996) observed similar cases of a mismatch between RED and the Base in Kikerewe which is triggered by unviolable phonological constraints.

In the Ciyao cases, the voicing of the pre-nasalized consonant is unviolable thus it is inevitable that identity constraints like MAX-BR, DEP-BR and Anchoring must be violated. This is because the initial consonant of RED must appear voiced since it is pre-nasalized. This implies that there will be no identity between that consonant and its correspondent in the Base. This unviolable constraint for pre-nasalized consonants to be voiced will inevitably destroy the identity between RED and the Base which implies that faithfulness constraints must be subordinated to the unviolable phonological constraint of voicing.

Below, we present an evaluation of the candidates involving these constraints. The voicing constraint is formulated as in (38) (where /N/ stands for a moraic nasal and /VL/ represents voicelessness).

(38) Voicing Constraint

*NCvl

(39)

	/n-RED-kat-ile/	*NCvl	IDENT-IO	MAX-BR	DEP-BR
✔	a) n-gat-ile-[kat-ile		*	*	*

b) n-kat-ile-[kat-ile	*!			
c) n-gat-ile-[gat-ile		*!!	*	*
d) n-gat-ila-[kat-ile		*!!	*	*

The most optimal candidate in the forms above is (39a) because it obeys the most highly ranked constraint of pre-nasalized consonant voicing despite violating the identity constraints Ident-IO, MAX-BR and DEP-BR. Candidate (39b) has a fatal violation of the highest constraint since RED has an unvoiced pre-nasalized consonant although it is faithful to the low ranking constraints Ident-IO, MAX-BR and DEP-BR. Candidate (39c) has a fatal violation of Ident-IO because the voicing of the Base stem is different from its input voicing since the stem contains a voiced consonant instead of a voiceless one as in the input. Likewise, there is a mismatch in features in the candidate in (39d) since RED ends in /a/ instead of the input /e/ thus violating Ident-IO.

In fact the voicing mismatches between RED and the Base observed in (39) are the sort of "undercopy" type of mismatch which M^{c}Carthy and Prince (1995) have proposed should be handled by ranking Ident-IO above MAX-/DEP-BR.

3 CONCLUSION

The paper has presented cases of verbal reduplication in Ciyao in which differences in the ranking of certain constraints have accounted for mismatches between the stem (BASE) and the Reduplicant. Instances of vowel initial stem reduplication have been shown to be explained through high ranking constraints which require that the Base should respect the Onset Principle and Morpheme Integrity while RED respects a rather language-specific constraint of /j/ deletion.

It has also been demonstrated that unviolable phonological constraints like pre-nasalized consonant voicing subordinate identity constraints like Ident-IO, MAX-BR and DEP-BR and thus inevitably destroy the expected match between RED and the Base.

FOOTNOTES

1. There are complicated lexical factors which determine the choice of the shape of the tense suffix.

2. For ease of reference, the term "verb stem" will be used synonymously with "inflectional stem", unless otherwise indicated.

3. See also Downing 1997, 1999a, 2000, Mutaka and Hyman 1990, for more examples from Kinande and the Nguni languages Xhosa, Zulu and Siswati.

4. The letter /j/ will be used to stand for the voiced alveo-palatal affricate.

5. In contrast, cases involving the non-moraic nasal as found in the second person (singular) subject prefix /m/ fail to trigger voicing of the stem initial consonants as shown in the following forms: m-pes-ile (you are tired), m-telec-e (you have cooked), m-piikeen-e (you have listened) and m-kat-ile (you have cut).

Reference

Bickmore, L. (1997). Bantu Tone Spreading and Displacement as Alignment and Minimal Misalignment (Ms). University at Albany, SUNNY.

Cassimjee, F & C. Kisseberth, (1998). Optimality Domains Theory and Bantu Tonology: a Case Study from IsiXhosa and Shingazidja. In Hyman, L & C. Kisseberth (eds). Theoretical Aspects of Bantu Tone. CSLI Publications. Stanford, CA.

Carleton, T. (1995). OCP and Tone Spread in Yao: an Optimality Account. In Carleton, T., T. Elorrieta & M. Moosally (eds). Texas Linguistics Forum 35: Papers in Phonetics and Phonology. Department of Linguistics, University of Texas, Austin.

Cole, J & C. Kisseberth (1994). An Optimal Domains Theory of Harmony. Studies in the Linguistics Sciences, 24.

Crystal, D. (1997). A Dictionary of Linguistics and Phonetics, 4th Edition. Blackwell Publishers Ltd.

Downing, L. (1994). Siswati Verbal Reduplication and the Theory of Generalized Alignment. Proceedings of NELS 24, 81-95.

- (1996). On the Prosodic Misalignment of Onsetless Syllables (Ms). University of British Columbia. Published (1998) in Natural Language and Linguistic Theory, 16. 1-52.

- (1997). Prosodic Misalignment and Reduplication. (Ms). University of British Columbia.

- (1999a). Morphological Contraints on Bantu Reduplication. Linguistic Analysis. 29. (1-2), 6-46.

- (1999b). Verbal Reduplication in Three Bantu Languages. In Hulst, H. V.d., R. Kager & W. Zonneveld (eds). The Prodody-Morphology Interface. Cambridge University Press, Cambridge.

- (2000). Morphological and Prosodic Constraints on Kinande Verbal Reduplication. Phonology, 17. 1-38.

- (2001a). Minimal Tone Domains in Southern Bantu Reduplication. (Ms). ZAS, Berlin.

- (2001b). Tone in Bantu Reduplication. (Ms). ZAS, Berlin.

- (2001c). Liquid Spirantization in Jita. Malilime. Malawian Journal of Linguistics. No. 2. University of Malawi.

- (2001d). How Ambiquity of Analysis Motivates Stem Tone Change in Durban Zulu. UBC Working Papers in Linguistics 4, 39-55.

Goedemans, R. (1996). An Optimity Account of Onset Sensitivity in Quantity Insensitive Languages. The Linguistic Review 13, 33-48.

Guthrie, M. (1967-70). Comparative Bantu. Vols. I-IV. Oxford University Press. Claredon.

Hubbard, K. (1994). Duration in Moraic Theory. Ph.D Dissertation. UC, Berkeley, CA.

Hyman, L & A. Mtenje. (1999). Prosodic Morphology and Tone: the Case of Chichewa. In Kager, R., H. Van der Hulst & W. Zonneveld (eds). The Prosody-Morphology Interface. Cambridge University Press. Cambridge. 90-133.

Inkelas, S. (1989). Prosodic Consituency in the Lexicon. Ph.D Dissertation. Stanford University, CA.

Inkelas, S. & Zoll. (1999). Reduplication as Double Stem Selection. Paper presented at the Phonology 2000 Symposium, Havard and MIT.

Itô, J & A. Mester. (1999). Realignment. In Van der Hulst et al. (1999). 188-217.

Kiparsky, P. (1982). Lexical Phonology and Morphology. Linguistics in the Morning Calm. The Linguistic Society of Korea. Hanshin Publishing Co., Seoul.

- (1985). Some Consequences of Lexical Phonology. Phonology Yearbook 2. 83-136.

McCarthy, J. & A. Prince. (1993a). Generalized Alignment. In Geert Booij & J. V. Marle (eds). Yearbook of Morphology 1993, 79-153.

- (1993b). Prosodic Morphology1: Constraint Interaction and Satisfaction. (Ms)., University of Massachesetts, Amherst & Rutgers University.

- (1994). The Emergence of the Unmarked: Optimality in Prosodic Morphology. NELS 24, 333-379.

- (1995). Faithfulness and Reduplicative Identity. In Beckman J., L. Dickey & S. Urbanczyk (eds). Papers in Optimality Theory. University of Massachusettes Occassional Papers 18, 249-384.

- (1999). Faithfulness and Identity in Prosodic Morphology. In Van der Hulst et al. (1999). 218 –309.

Mchombo, S. (1999). Argument Structure and Verbal Morphology in Chichewa. Malilime. Malawian Journal of Linguistics. No. 1. University of Malawi. 57-75.

- (2001). Chichewa Verbal Structure and the Study of Cognition. Malilime. Malawian Journal of Linguistics. No. 2. University of Malawi.

Mohanan, K. P. (1982). The Theory of Lexical Phonology. Ph.D Dissertation. MIT.

Moto, F. (1989). Phonology of the Bantu Lexicon. Ph.D Dissertation. University College London.

Mtenje, A. (1985). Extraharmonicality in Bantu. Sheffield Working Papers in Linguistics. University of Sheffield.

- (1986). Issues in the Nonlinear Phonology of Chichewa. Ph.D Dissertation. University College London.

- (1988) . On Tone and Transfer in Chichewa Reduplication. Linguistics. 125-155.

- (1990a). On the Inadmissibility of Feature – Changing Rules in Phonological Theory: Evidence from Chiyao. Journal of Contemporary African Studies. Vol. 8/9. No. ½: 79-108.

- (1990b). Feature-Spreading in Phonology: Evidence from Chiyao. Linguistics Analysis. Vol. 20. No. 1-2, 87-103.

- (1993). Verb Structure and Tone in Chiyao. In Mufwene, S & L. Moshi (eds). Topics in African Linguistics. John Benjamins Publishing Co. Amsterdam/Philadelphia, 179-190.

- & D. Odden. (1990). Problems in Chiyao Tone. Paper presented at the 21st ACAL Meeting. University of Georgia, Athens.

Mutaka, N. (1994). The Lexical Tonology of Kinande. LINCOM. Europa. Munich.

Mutaka, N. & L. Hyman (1990). Syllables and Morpheme Integrity in Kinande Reduplication. Phonology 7. 73-119.

Myers, S. (1997). OCP Effects in Optimality Theory. NLLT 15. 847-892.

- (1998). Aux in Bantu Morphology and Phonology. In Hyman, L & C. Kisseberth (eds). Theoretical Aspects of Bantu Tone. CSLI Publications. Stanford.

- Myers, S. & T. Carleton (1996). Tonal Transfer in Chichewa. Phonology 13. 39-72.

Nagy, N & B. Reynolds (1997). Optimality Theory and Variable Word Final Deletion in Faetor. Language Variation and Change 9. 37-56.

Ngunga, A. (1997). Lexical Phonology and Morphology of the Ciyao Verb Stem. Ph.D Dissertation. UC, Berkeley. CA.

- (1998). Imbrication in Ciyao. In Maddieson, I and T. Hinnebusch (eds). Language History and Description in Africa: Trends in African Linguistics. Vol. 2. Africa World Press. The Red Sea Press inc.

Odden, D. (1996). Patterns of Reduplication in KiKerewe. OSU Working Papers in Linguistics 48. 111-149.

Odden, D. (1998). Principles of Tone Assignment in Tanzanian Yao. In Hyman, L & C. Kisseberth (eds). Theoretical Aspects of Bantu Tone. CSLI Publications. Stanford. CA.

Prince, A & P. Smolensky (1993). Optimality Theory: Constraint Interaction in Generative Grammar. (Ms). Rutgers University and University of Colorado at Boulder.

Pulleyblank, D. (1986). Tone in Lexical Phonology. Reidel, Dordrecht.

- (1996). Neutral Vowels in Optimality Theory: a Comparison of Yoruba and Wolof. Canadian Journal of Linguistics 41. 295-347.

Ringen, C. & O. Heinämäki (1999). Variation in Finish Vowel Harmony: an OT Account. NLLT 17. 303-337.

Zoll, C. (1996). Parsing Below the Segment in a Constraint Based Framework. Ph.D Dissertation. UC, Berkeley.

FL027684

U.S. Department of Education
Office of Educational Research and Improvement (OERI)
National Library of Education (NLE)
Educational Resources Information Center (ERIC)

REPRODUCTION RELEASE

(Specific Document)

I. DOCUMENT IDENTIFICATION:

Title: An Optimality Theoretic Account of Ciyao VErbal Reduplication	
Author(s): Al Mtenje	
Corporate Source:	Publication Date:

II. REPRODUCTION RELEASE:

In order to disseminate as widely as possible timely and significant materials of interest to the educational community, documents announced in the monthly abstract journal of the ERIC system, *Resources in Education* (RIE), are usually made available to users in microfiche, reproduced paper copy, and electronic media, and sold through the ERIC Document Reproduction Service (EDRS). Credit is given to the source of each document, and, if reproduction release is granted, one of the following notices is affixed to the document.

If permission is granted to reproduce and disseminate the identified document, please CHECK ONE of the following three options and sign at the bottom of the page.

The sample sticker shown below will be affixed to all Level 1 documents

PERMISSION TO REPRODUCE AND DISSEMINATE THIS MATERIAL HAS BEEN GRANTED BY

Sample

TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)

1

Level 1

☑

Check here for Level 1 release, permitting reproduction and dissemination in microfiche or other ERIC archival media (e.g., electronic) and paper copy.

The sample sticker shown below will be affixed to all Level 2A documents

PERMISSION TO REPRODUCE AND DISSEMINATE THIS MATERIAL IN MICROFICHE, AND IN ELECTRONIC MEDIA FOR ERIC COLLECTION SUBSCRIBERS ONLY, HAS BEEN GRANTED BY

Sample

TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)

2A

Level 2A

☐

Check here for Level 2A release, permitting reproduction and dissemination in microfiche and in electronic media for ERIC archival collection subscribers only

The sample sticker shown below will be affixed to all Level 2B documents

PERMISSION TO REPRODUCE AND DISSEMINATE THIS MATERIAL IN MICROFICHE ONLY HAS BEEN GRANTED BY

Sample

TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)

2B

Level 2B

☐

Check here for Level 2B release, permitting reproduction and dissemination in microfiche only

Documents will be processed as indicated provided reproduction quality permits.
If permission to reproduce is granted, but no box is checked, documents will be processed at Level 1.

I hereby grant to the Educational Resources Information Center (ERIC) nonexclusive permission to reproduce and disseminate this document as indicated above. Reproduction from the ERIC microfiche or electronic media by persons other than ERIC employees and its system contractors requires permission from the copyright holder. Exception is made for non-profit reproduction by libraries and other service agencies to satisfy information needs of educators in response to discrete inquiries.

Sign here, please

Signature:	Printed Name/Position/Title: PROF AL D. MTENJE
Organization/Address: CENTER FOR LANGUAGE STUDIES, UNIVERSITY OF MALAWI	Telephone: 265 1525 709 / FAX: 265 1524297
	E-Mail Address: / Date:

(over)

III. DOCUMENT AVAILABILITY INFORMATION (FROM NON-ERIC SOURCE):

If permission to reproduce is not granted to ERIC, or, if you wish ERIC to cite the availability of the document from another source, please provide the following information regarding the availability of the document. (ERIC will not announce a document unless it is publicly available, and a dependable source can be specified. Contributors should also be aware that ERIC selection criteria are significantly more stringent for documents that cannot be made available through EDRS.)

Publisher/Distributor:
Address:
Price:

IV. REFERRAL OF ERIC TO COPYRIGHT/REPRODUCTION RIGHTS HOLDER:

If the right to grant this reproduction release is held by someone other than the addressee, please provide the appropriate name and address:

Name:
Address:

V. WHERE TO SEND THIS FORM:

Send this form to the following ERIC Clearinghouse:

ERIC Clearinghouse on
Languages & Linguistics
4646 40TH St. NW
Washington, D.C. 20016-1859

However, if solicited by the ERIC Facility, or if making an unsolicited contribution to ERIC, return this form (and the document being contributed) to:

Post-it® Fax Note 7671	Date 5/2	# of pages ▶
To Al Mckenzie	From Laurel	
Co./Dept.	Co. CAL	
Phone #	Phone #	
Fax # 265 524097	Fax # 202-363-7204	

EFF-088 (Rev. 2/2000)